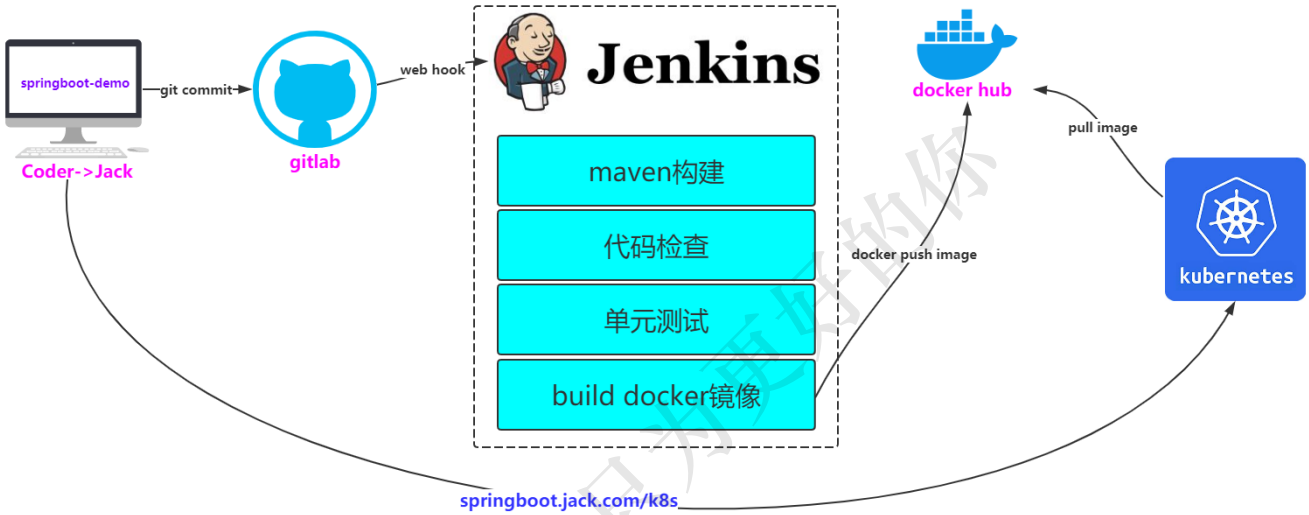
01 CICD

在网盘中我会提供一个md的版本[名称为“笔记命令复制伴侣.md"

主要考虑到大家复制命令的时候，如果直接在pdf中复制，会有乱码问题，可以到md的版本中直接复制

> 思考：如果springboot-demo需要修改某些代码，按照上述流程，是不是又要重新打包？然后写Dockerfile，push镜像，然后写k8s配置文件等等之类的操作



> 思路：如果能够按照上述图解一样，在本地进行开发，然后git push到github，就能访问最终的应用该多好

1.1 环境准备

1.1.1 基础环境准备[在jenkins那台机器上安装]

- 安装java

  > (1)找到jdk资源上传到指定机器

  ```
  resources/cicd/jdk-8u181-linux-x64.tar.gz
  ```

  > (2)配置环境变量

```
vim /etc/profile

export JAVA_HOME=/usr/local/java/jdk1.8.0_181
export
CLASSPATH=.:${JAVA_HOME}/jre/lib/rt.jar:${JAVA_HOME}/lib/dt.jar:${JAVA_HOME}/lib/tools
.jar
export PATH=$PATH:${JAVA_HOME}/bin

source /etc/profile

java -version
```

- 安装maven

> (1)找到maven资源上传到指定机器

```
resources/cicd/apache-maven-3.6.2-bin.tar.gz
```

> (2)配置环境变量

```
vim /etc/profile

export MAVEN_HOME=/usr/local/maven/apache-maven-3.6.2
export PATH=$PATH:$JAVA_HOME/bin:$MAVEN_HOME/bin

source /etc/profile

mvn -version
```

> (3)配置maven的阿里云镜像

```
<mirror>
    <id>alimaven</id>
    <name>aliyun maven</name>
    <url>http://maven.aliyun.com/nexus/content/groups/public/</url>
    <mirrorOf>central</mirrorOf>
</mirror>
```

- 安装配置git

> (1)下载安装

```
yum install git
```

> (2)配置git

```
git config --global user.name "itcrazy2016"
git config --global user.email "itcrazy2016@163.com"
ssh-keygen -t rsa -C "itcrazy2016@163.com"  --->将公钥上传到github:/root/.ssh/id_rsa.pub
```

1.1.1 IDEA+Spring Boot项目

```
01 下载项目
    git clone git@github.com:itcrazy2016/springboot-demo.git

02 使用idea打开
    此时项目已经和github关联
```

1.1.2 Gitlab

> 直接采用github

git@github.com:itcrazy2016/springboot-demo.git

1.1.3 Jenkins

> 必须在k8s集群中，因为后面需要在jenkins的目录下创建文件执行，比如这里选用**w2**

> (1)操作前须知
>
> `jenkins官网`:https://jenkins.io/
>
> `入门指南`:<https://jenkins.io/zh/doc/pipeline/tour/getting-started/

> (1)找到对应资源：resources/cicd/jenkins.war

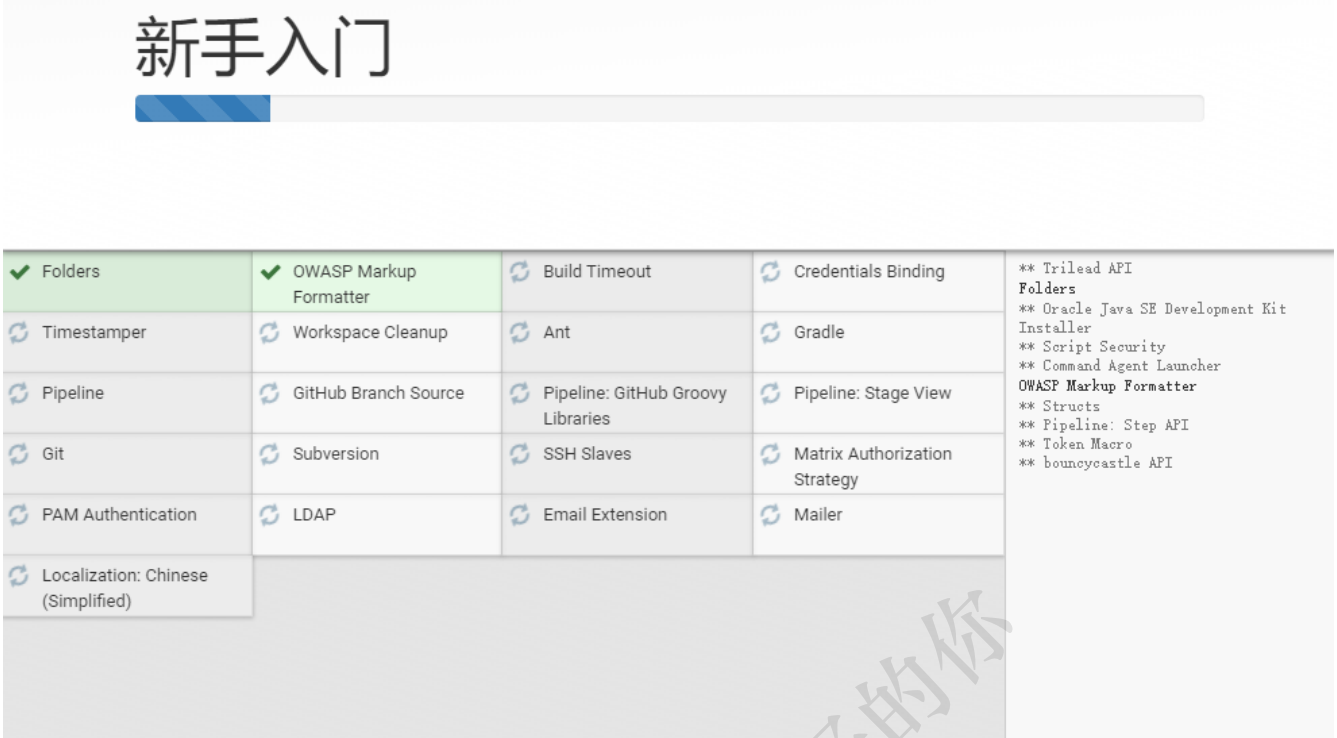
```
wget http://mirrors.jenkins.io/war-stable/latest/jenkins.war
```

> (2)启动jenkins[**记得当前机器安装了jdk/jre，不然运行不了**]

```
nohup java -jar jenkins.war --httpPort=8080 &
tail -f nohup.out
```

> (3)win浏览器访问w2的ip 121.40.56.193:8080，记录下密码，比如
>
> cat /root/.jenkins/secrets/initialAdminPassword

> (4)安装推荐的插件

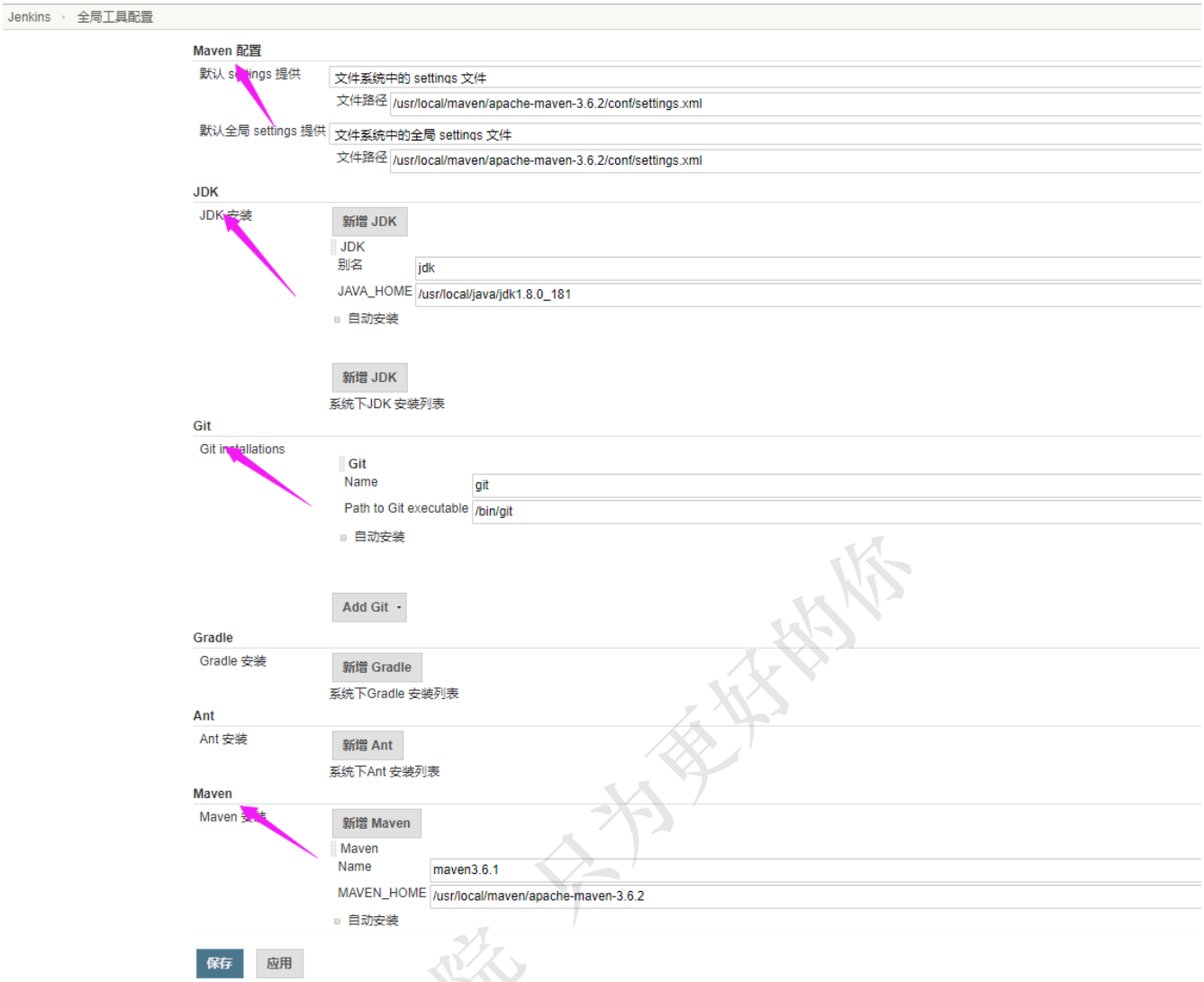


> (5)创建一个用户，比如

```
username:jack
password:123456
```

> (6)安装配置git，maven

> (7)在jenkins上使用centos的java，git，maven等
>
> [系统管理]->[全局工具配置]->[Maven、JDK、Git等]



1.1.4 Docker hub

> 使用阿里云docker镜像仓库，或者自己搭建一个

比如使用阿里云的

```
docker login --username=itcrazy2016@163.com registry.cn-hangzhou.aliyuncs.com
```

1.1.5 Kubernetes集群

> 直接使用之前大家自己搭建的K8s集群

1.2 必要测试

1.2.1 pipeline任务

> `关注`: /root/.jenkins/workspace目录

> (1)创建jenkins的task

> (2)拉取github代码，在最下面编写pipeline，然后“保存和立即构建”，同时可以查看“Console Output”

```
node {
   def mvnHome
   stage('Preparation') { // for display purposes

      git 'https://github.com/itcrazy2016/springboot-demo.git'

   }
}
```

> (3)来到w2节点：ls /root/.jenkins/workspace/springboot-demo

```
[root@w2 ~]# ls /root/.jenkins/workspace/springboot-demo/
mvnw  mvnw.cmd  pom.xml  src
[root@w2 ~]#
```

> (4)配置springboot-demo的task，修改pipeline内容，增加maven构建，然后“保存和立即构建”，同时可以查看“Console Output”

```
node {
   def mvnHome
   stage('Preparation') {
      git 'https://github.com/itcrazy2016/springboot-demo.git'
   }

   stage('Maven Build') {
      sh "mvn clean package"
   }
}
```

> (5)来到w2节点：ls /root/.jenkins/workspace/springboot-demo

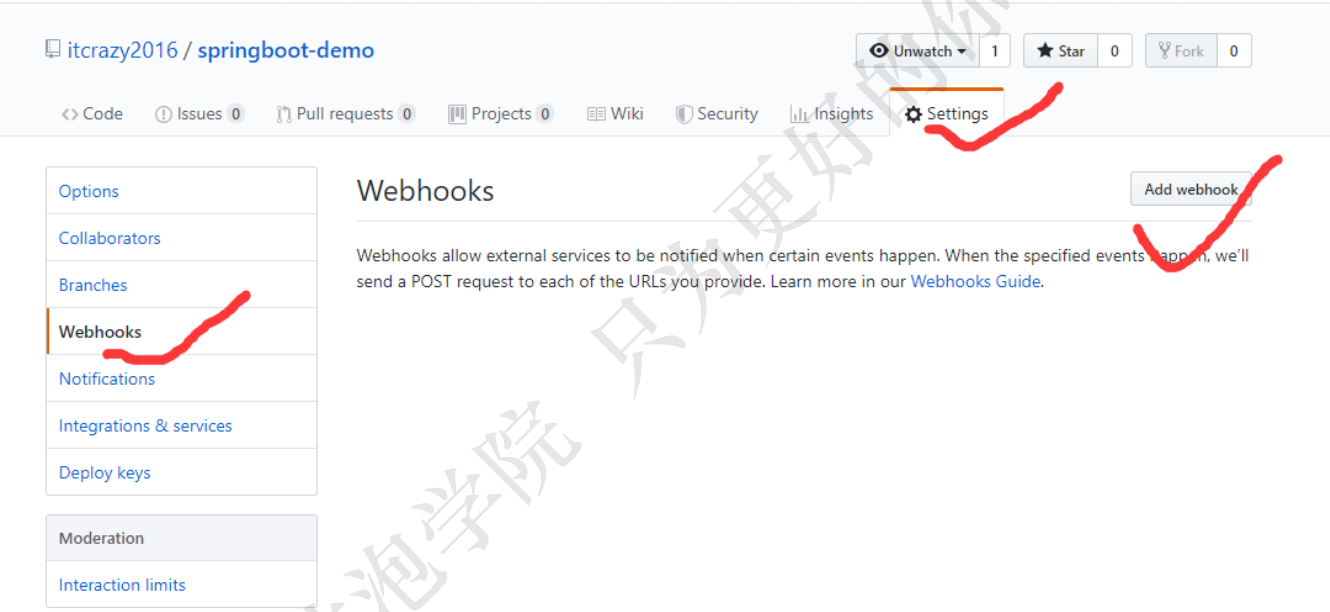
```
[root@w2 ~]# ls /root/.jenkins/workspace/springboot-demo/
mvnw  mvnw.cmd  pom.xml  src  target
[root@w2 ~]#
```

小结：至此，我们已经可以通过在jenkins上手动构建的方式，拿到github上的代码，并且用maven进行构建。

1.2.2 git push触发jenkins自动构建

> 最好的话:当用户进行git commit/push提交代码到github时，能够通知**jenkins自动构建**
>
> 注意:jenkins的ip一定要是github能够访问到的地址

> (1)在github上配置jenkins的webhook地址
>
> http://121.40.56.193:8080/springboot-demo



itcrazy2016 / springboot-demo

Unwatch 1 | Star 0 | Fork 0

Code | Issues 0 | Pull requests 0 | Actions | Projects 0 | Wiki | Security | Insights | Settings

Options
Collaborators
Branches
Webhooks
Notifications
Integrations & services
Deploy keys
Secrets
Actions

Moderation
Interaction limits

Webhooks / **Manage webhook**

We'll send a `POST` request to the URL below with details of any subscribed events. You can also specify which data format you'd like to receive (JSON, `x-www-form-urlencoded`, *etc*). More information can be found in our developer documentation.

Payload URL *

http://121.40.56.193:8080/springboot-demo

Content type

application/x-www-form-urlencoded

Secret

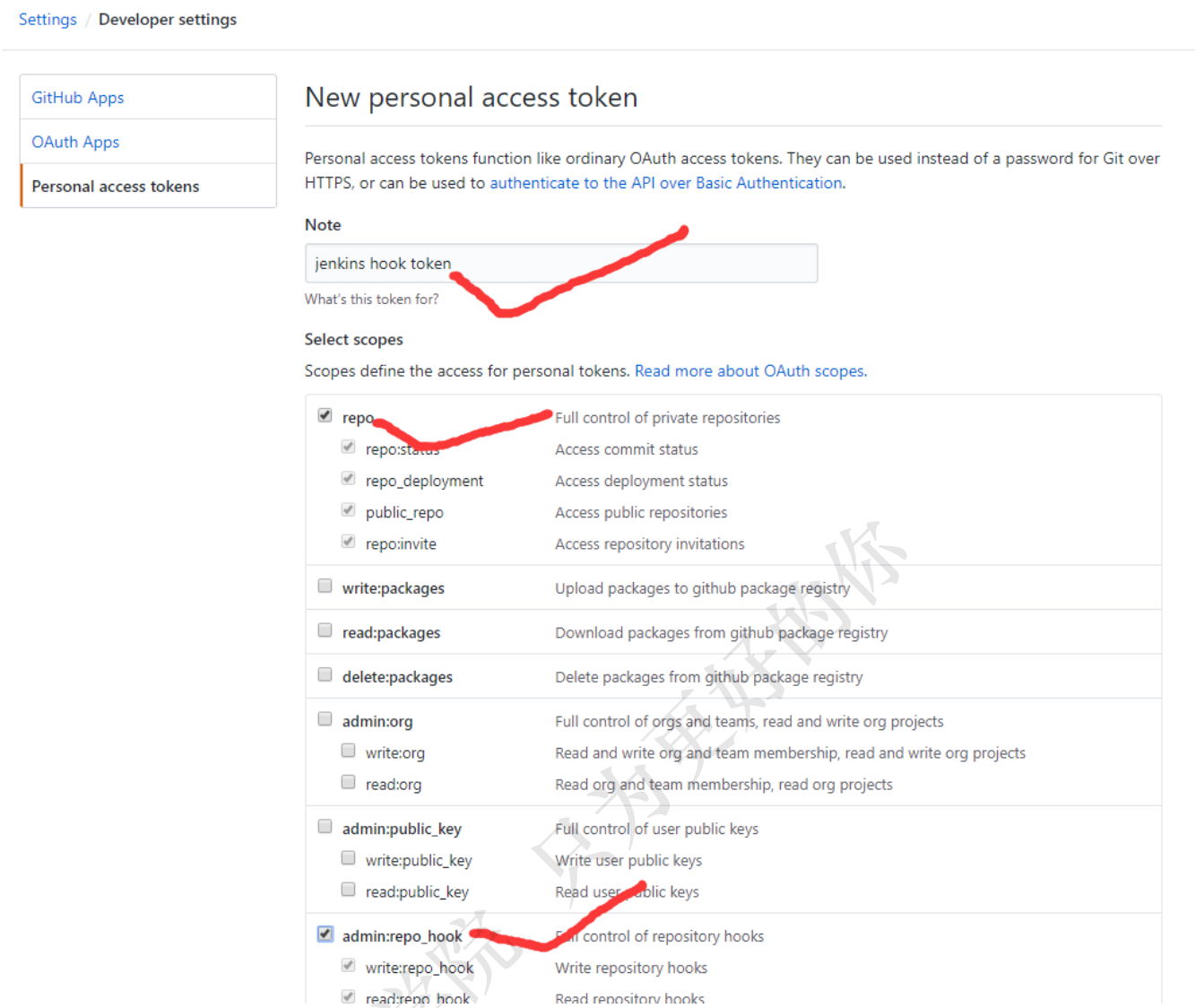
Which events would you like to trigger this webhook?

- Just the `push` event.
- Send me **everything**.
- Let me select individual events.

☑ Active
We will deliver event details when this hook is triggered.

Update webhook | Delete webhook

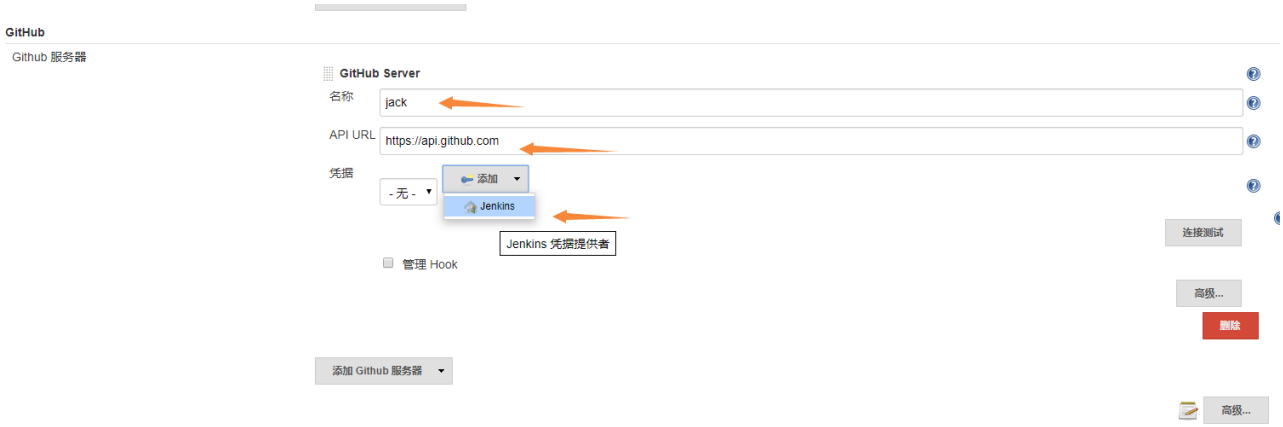
> (2)生成Personal access tokens
>
> Jenkins访问github需要授权，所以在github上生成token交给jenkins使用，即`Personal access tokens`
>
> github的Settings[个人信息右上角]-->Developer settings-->Personal access tokens-->Generate new token
>
> 最后保存好该token，比如:**72f048b514e95d6fe36f86d84374f2dcce402b43**



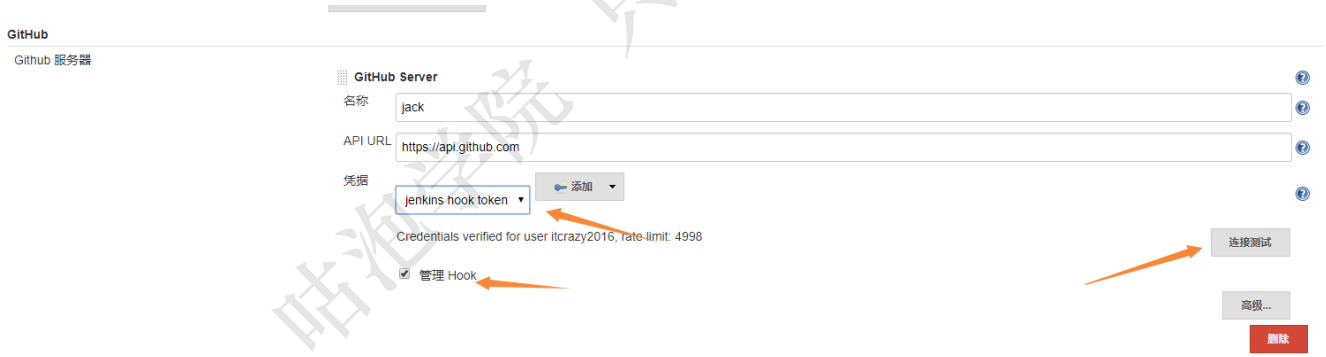
> (3)jenkins安装插件

```
01 安装github plugin插件:[系统管理]->[插件管理]->[可选插件]
02 安装gitlab插件和gitlab hook插件:[系统管理]->[插件管理]->[可选插件]
```

> (4)配置GitHub Server
>
> [系统管理]->[系统配置]->[找到github服务器]->[添加github服务器]
>
> 然后按照下面图片步骤进行操作



然后进行测试，最后点击最下面的保存



1.3 核心实战走起

1.3.1 build&push镜像

> **经过前面的折腾，肯定可以获取到代码，并且用maven进行构建了，最终拿到一个target/xxx.jar**
>
> 来到w2上的workspace目录：cd /root/.jenkins/workspace

> (1)准备一个文件，名称为springboot-demo-build-image.sh

```
mkdir /root/.jenkins/workspace/scripts/

vi /root/.jenkins/workspace/scripts/springboot-demo-build-image.sh
```

> (3)编写springboot-demo-build-image.sh文件

```
# 进入到springboot-demo目录
cd ../springboot-demo

# 编写Dockerfile文件

cat <<EOF > Dockerfile
FROM openjdk:8-jre-alpine
COPY target/springboot-demo-0.0.1-SNAPSHOT.jar /springboot-demo.jar
ENTRYPOINT ["java","-jar","/springboot-demo.jar"]
EOF

echo "Dockerfile created successfully!"

# 基于指定目录下的Dockerfile构建镜像
docker build -t registry.cn-hangzhou.aliyuncs.com/itcrazy2016/springboot-demo:v1.0 .

# push镜像，这边需要阿里云镜像仓库登录，在w2上登录
docker push registry.cn-hangzhou.aliyuncs.com/itcrazy2016/springboot-demo:v1.0
```

> (4)增加pipeline

```
node {
   def mvnHome
   stage('Preparation') {
      git 'https://github.com/itcrazy2016/springboot-demo.git'
   }

   stage('Maven Build') {
      sh "mvn clean package"
   }

   stage('Build Image') {
      sh "/root/.jenkins/workspace/scripts/springboot-demo-build-image.sh"
   }
}
```

> (5)采坑

```
# 01 文件权限
/root/.jenkins/workspace/springboot-demo@tmp/durable-7dbf7e73/script.sh: line 1:
/root/.jenkins/workspace/scripts/springboot-demo-build-image.sh: Permission denied
# 解决
chmod +x /root/.jenkins/workspace/scripts/springboot-demo-build-image.sh


# 02 docker没有运行
Cannot connect to the Docker daemon at unix:///var/run/docker.sock. Is the docker daemon
running?
# 解决
systemctl start docker
systemctl enable docker
```

```
# 03 push权限
docker login --username=itcrazy2016@163.com registry.cn-hangzhou.aliyuncs.com
```

1.3.2 Kubernetes拉取镜像运行

> **经过前面的折腾，现在已经能够把镜像push到镜像仓库了，接下来就是k8s拉取镜像并且运行在集群中咯**
>
> 根据前面的经验，肯定再创建一个stage，然后运行sh脚本，脚本中执行内容，包括yaml文件

> (1)编写springboot-demo.yaml文件
>
> 在/root/.jenkins/workspace/scripts/目录下创建springboot-demo.yaml

```yaml
# 以Deployment部署Pod
apiVersion: apps/v1
kind: Deployment
metadata:
  name: springboot-demo
spec:
  selector:
    matchLabels:
      app: springboot-demo
  replicas: 1
  template:
    metadata:
      labels:
        app: springboot-demo
    spec:
      containers:
      - name: springboot-demo
        image: registry.cn-hangzhou.aliyuncs.com/itcrazy2016/springboot-demo:v1.0
        ports:
        - containerPort: 8080
---
# 创建Pod的Service
apiVersion: v1
kind: Service
metadata:
  name: springboot-demo
spec:
  ports:
  - port: 80
    protocol: TCP
    targetPort: 8080
  selector:
    app: springboot-demo
---
# 创建Ingress，定义访问规则
apiVersion: extensions/v1beta1
kind: Ingress
metadata:
  name: springboot-demo
```

```yaml
spec:
  rules:
  - host: springboot.jack.com
    http:
      paths:
      - path: /
        backend:
          serviceName: springboot-demo
          servicePort: 80
```

> (2)编写k8s-deploy-springboot-demo.sh文件
>
> vi /root/.jenkins/workspace/scripts/k8s-deploy-springboot-demo.sh

```
kubectl delete -f springboot-demo.yaml

kubectl apply -f /root/.jenkins/workspace/scripts/springboot-demo.yaml

echo "k8s deploy success!"
```

> (3)编写pipeline

```
node {
   def mvnHome
   stage('Preparation') {
      git 'https://github.com/itcrazy2016/springboot-demo.git'
   }

   stage('Maven Build') {
      sh "mvn clean package"
   }

   stage('Build Image') {
      sh "/root/.jenkins/workspace/scripts/springboot-demo-build-image.sh"
   }

   stage('K8S Deploy') {
      sh "/root/.jenkins/workspace/scripts/k8s-deploy-springboot-demo.sh"
   }
}
```

> (4)采坑

```
# 01 权限
/root/.jenkins/workspace/springboot-demo@tmp/durable-8404142a/script.sh: line 1:
/root/.jenkins/workspace/scripts/k8s-deploy-springboot-demo.sh: Permission denied
# 解决
chmod +x /root/.jenkins/workspace/scripts/k8s-deploy-springboot-demo.sh


# 02 worker02执行不了kubectl
切换到master上, cd ~  --->  cat .kube/config  --->复制内容
切换到worker02上   cd ~  --->  vi .kube/config   --->粘贴内容
```

> (5)win的hosts文件

```
192.168.0.61 springboot.jack.com
```